Commercial Fisheries Abstracts

a monthly summary of important developments for the fishery industries

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DOUGLAS McKAY, Secretary

FISH AND WILDLIFE SERVICE

JOHN L. FARLEY, Director

Commercial Fisheries Abstracts

Prepared in the Branch of Commercial Fisheries

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In addition to the regular abstracts, there is included a bibliography of references of secondary importance (without abstracts). These may be cut off on the lines designated and pasted on standard 3 x 5-inch cards for filing.

Following is a brief outline of this filing system. The numbers apply to the first digit appearing on each card. For the meaning of subsequent digits, please see the above described leaflet.

0 General and theoretical
1 Fish by species
2 Fresh fish
3 Preserved fish
4 Oils
5 Vitamins
6 Fishery by-products
7 Analytical Methods
8 Composition
9 Miscellaneous

Issued with the approval of the Bureau of the Budget, December 29, 1950

6.53 B. C. WHALE MEAT FROZEN FOR PETS

Anonymous
Pacific Fisherman 51, No. 9, 71 (August, 1953)

Part of a Hoquiam, Washington cannery has been leased to a California fish processor for use in manufacturing a ground pet food from whale meat. Operations began with the arrival of 100 tons of whale meat loins from the Coal Harbor whaling station on Vancouver Island. Delivery was made in the refrigerated hold of the M. V. Iceland.

According to plant operators, frozen whale meat for pets is expected to become a $70,000 to $100,000 a month business within the next 6 months. The high protein, fat-free whale loins are to be ground, packed into 1-pound cartons, frozen, and marketed primarily as a dog and cat food. Other interested consumers include the Washington State Department of Fisheries which plans to use the ground meat for feeding hatchery fish, and various mink ranchers in Washington and Oregon.

 ABSTRACTER: Martin Heerdt

2.1128 A PRACTICAL MECHANICAL OYSTER DREDGER

Anonymous
Fishing Gazette 70, No. 6, 50D (June, 1953)

A Bayville, Long Island dredger, the Frank M. Flower, is said to be the only dredger in the country equipped with both the self-dumping type dredges and a suction dredge, as well as hydraulically-controlled conveyors. The installation of this equipment has only recently been completed and it is now being tried out for the first time in regular oystering operations.

A diesel engine is installed below deck forward to drive a big centrifugal pump. The intake for the pump is in the bottom of the ship on the port side. The conveyors, used when screening oysters and loading them on the deck, are driven by hydraulic pumps and motors installed further aft. The balance of the machinery on board including the winches that operate the port and starboard dredges, is driven off the main engine, a 250-horsepower diesel.

The suction dredge, which has the appearance of a huge vacuum cleaner, is carried on the port side. The pump that operates the suction dredge is also used when screening, and for washing oysters overboard when planting. All of the controls are located in the wheelhouse and are within reach of the operator standing at the normal steering station.

The vessel has no steering wheel but relies entirely on its automatic steering equipment. When over the oyster beds steering is done by means of a hand-held, remote-control unit that is operated with the thumb and finger of one hand. This allows the other hand to be free to operate the winch controls of the dredges.

(over)

 ABSTRACTER: Roy C. Stevens

4.13 NEW ZEALAND FISH OILS. 6. SEASONAL VARIATION IN THE COMPOSITION OF NEW ZEALAND GROPER (POLYPRION OXYGENEIOS) LIVER OIL

Shorland, F. B. (Fats Research Laboratory, Department of Scientific and Industrial Research, Wellington, New Zealand)
Biochemical Journal 54, No. 4, 673-677 (July, 1953)

The vitamin A, cholesterol, total unsaponifiable, and phospholipid content, as well as the iodine value, oil yield, and size of grouper livers were found to change with the season.

When the oil content of the liver was low immediately following spawning in September-October, the vitamin A, cholesterol, total unsaponifiable matter, phospholipid and iodine value increased significantly (figure 1, this card, over). The oil content of the pyloric caeca also diminished during September-October, but without any spectacular rise in vitamin A content as was observed in the liver oil (figure 2, over). A significant reduction in vitamin A took place in both the pyloric caeca and the liver during July-August without any appreciable change in the oil content of either.

Distribution data (table 1) indicated that the oil was spread rather evenly throughout the fish; whereas the vitamin A reserves were concentrated in the liver with smaller quantities in the pyloric caeca and in the body of the male fish. Large livers contained almost twice the percentage of oil found in small livers. The vitamin A, cholesterol, total unsaponifiable matter, and lipid phosphorus, however, were relatively unaffected by the size of the liver.

(over)

 ABSTRACTER: Martin Heerdt

6.193 UNIDENTIFIED GROWTH FACTORS FOR CHICKS

McGinnis, J.; Warden, W. K.; Reynolds, W. M.; Luther, H. G.; Kersey, R. C.; and Fenney, R. J.
Federation Proceedings 12, No. 1 (Part I), 423 (March, 1953)

Experiments were conducted with chicks in which both a purified type of basal diet, composed largely of cerelose and isolated soybean protein, and a practical type of chick diet composed largely of ground corn and soybean oil meal were fed. The results obtained by supplementing the diet with fish solubles and a number of different fermentation products showed that with the purified diets the responses to fermentation products were much greater than with fish solubles. The responses to the same products added to the practical type diet were not as great as to the purified diet. Growth responses obtained from these products added to the two different diets were not due to antibiotics or vitamin B_{12}, since the basal diet contained these ingredients. The results obtained in these studies would indicate that the purified diet was deficient in at least two factors, one of which was supplied by fish solubles, and that fermentation products contained an unidentified factor in addition to that supplied by fish solubles.

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FROZEN WHALE MEAT AS PET FOOD

SEASONAL VARIATION IN GROUPER LIVER OILS

MODERNIZED MECHANICAL OYSTER DREDGER

UNIDENTIFIED GROWTH FACTORS

4.13 (Cross Reference: 8.53)

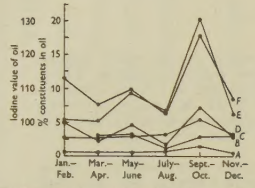


Fig. 1. Seasonal changes in: (*A*), % P in liver oil; (*B*), % vitamin A in liver oil; (*C*), % vitamin A in pyloric-caecal oil; (*D*), % cholesterol in liver oil; (*E*), iodine value in liver oil; and (*F*), % total unsaponifiable matter in liver oil.

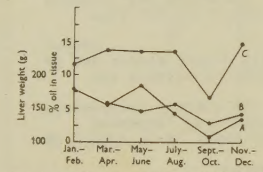


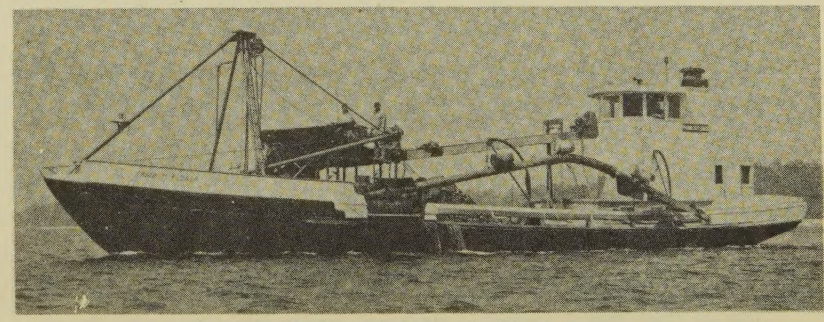
Fig. 2. Seasonal changes in: (*A*), liver weight; (*B*), % oil in pyloric caeca; and (*C*), % oil in livers.

Table 1. *Distribution of oil and of vitamin A in the tissues of the groper*

	Male fish, total wt. 6852 g., caught 11. ix. 40					Female fish, total wt. 14 975 g., caught 11. ix. 40				
Organ	Organ wt. (as % total weight of fish)	Oil (% of organ wt.)	Oil (as % total oil in fish)	Vitamin A (% of oil)	Vitamin A (as % of total vitamin A)	Organ wt. (as % total weight of fish)	Oil (% of organ wt.)	Oil (as % total oil in fish)	Vitamin A (% in oil)	Vitamin A (as % of total vitamin A)
Body (excluding backbone)	65·87	1·70	34·7	0·03	2·3	58·05	4·20	32·6	Trace	—
Head	23·92	6·93	51·4	Not found	—	22·10	14·90	43·9	Not found	—
Liver	1·34	6·45	2·8	14·1	88·9	2·25	8·19	2·4	11·1	93·5
Pyloric caeca	1·02	2·56	0·9	4·3	8·7	1·31	4·60	0·8	2·2	6·2
Intestines	0·77	1·58	0·3	0·2	0·1	0·89	2·73	0·3	0·3	0·3
Stomach	1·68	1·33	0·6	Not found	—	2·90	1·80	0·7	Not found	—
Milt (or roe)	1·18	1·92	0·6	0·03	Trace	9·27	11·34	14·0	Not found	—
Heart	0·19	1·41	Trace	Not found	—	0·19	4·28	—	Not found	—
Spleen	0·15	2·70	Trace	Trace	Trace	0·23	3·70	—	Trace	—
Backbone	3·88	7·10	8·7	Not found	—	2·81	14·34	5·3	Not found	—

6.53 (Cross Reference: 1.95)

2.1128 (Cross Reference: 1.81)



"Frank M. Flower" showing conventional dredge, suction dredge and conveyor.

1.95 NORWEGIAN MINKE WHALING

Pike, Gordon C.
Trade News 5, No. 12, 5-6 (June, 1953)

For several hundred years the small "minke" whale (Balaenoptera acutorostrata) has been hunted in Norwegian waters. In early times nets were strung across the narrow fjords along the west coast of Norway to prevent the whales from escaping to the sea, and the whales were attacked by local fishermen armed with poison arrows. Later, rifles were used. In some parts of Norway nets and rifles are still used, but the modern, well-organized "fishery" began to evolve with the adoption of harpoon guns mounted on small motor vessels. The participants in the present minke whaling industry rely on whaling as their chief source of income, although they continue to take part in the winter herring fishery and the Lofoten cod fishery until about the end of April.

Vessels are of the "cutter" type, ranging from 40 to 90 feet in length, but most of them are about 50 feet. The wheel house, cabin and engine are at the stern; and the hatch and working space amidships.

Nearly all whales are taken aboard the vessel on the whaling grounds. The blubber and meat is removed, and the carcass is returned to the sea. There are approximately 250-300 vessels in the Norwegian minke whaling fleet providing employment for 1,200 men. These vessels operating along the Norwegian coast run into port every day or two and the meat and blubber are sold to licensed buyers. The meat is usually deep frozen prior to shipment, but some is merely iced for sale on local markets. In postwar years the range of operations has been extended from Norwegian waters to include waters off the coast of northern England, Scotland, and waters as far afield as Spitzbergen and Iceland, staying out as long as two weeks from the time their first whale is caught. Since 1947 small

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 ABSTRACTER: Edward A. Schaefers

3.234 FREEZING AT SEA

Anonymous
Report of the Food Investigation Board (Great Britain) for 1952, 33-34 (1953)

Further attempts to predict the performance of large, vertical plate freezer installations have been made, using a single-station, laboratory model with Freon 22. Only a partial degree of control has been obtainable because of difficulty in maintaining a constant evaporator temperature, even when regulating compressor speeds and adjusting the expansion valve as the heat load diminishes. A flooded system employing forced circulation of the refrigerant is to be tried. This system, if successful, will replace the present one on board the M. F. V. Keelby.

The ship-borne freezer was used almost continuously early in 1952 to produce a series of blocks of frozen cod, the quality of which will determine limiting conditions for freezing at sea and for subsequent storage. The "sprag" cod that were frozen had been stowed for various periods both with and without ice and with and without eviscerating. The frozen cod were stored at both -20°C. (-4°F.) and -30°C. (-22°F.) for the first month and at -30°C. (-22°F.) only for the next 3 months.

After one months' storage the thawed flesh from cod that had been quick frozen immediately after death yielded abnormally large quantities of expressible fluid. When cooked, the flesh had a soft and "short" texture. Smoked cure prepared from these cod had a poor "gloss" and "cut." These defects disappeared, however, after an additional two months of storage.

(over)

 ABSTRACTER: Martin Heerdt

4.14 STUDIES ON THE WHALE OIL V-VI. FATTY ACIDS COMPOSITION OF THE SPERM WHALE OIL. (PART 1-2) ON THE HEAD CAVITY, BONE AND LARGE INTESTINE OILS

Saiki, Masamichi and Mori, Takajiro
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 11, 656 (1953)

Head cavity oil. sat.: C_{10} 6.7, C_{12} 22.7, C_{14} 15.3, C_{16} 3.9, C_{18} 0.3; unsat.:C_{12} 13.8 (-2H), C_{14} 14.8 (-2H), C_{16} 13.0 (-2H), C_{18} 7.1 (-2H), C_{20} 2.4 (-2H).

Bone oil. sat.: C_{10} 0.6, C_{12} 2.5, C_{14} 6.7, C_{16} 9.6, C_{18} 2.4; unsat.: C_{12} 0.8 (-2H), C_{14} 3.8 (-2H), C_{16} 23.4 (-2H), C_{18} 26.3 (-2H), C_{20} 19.5 (-2.2H), C_{22} 4.4.

Large intestine oil. sat.: C_{12} 1.4, C_{14} 5.7, C_{16} 12.0, C_{18} 1.4; unsat.:C_{12} 0.2 (-2H), C_{14} 1.5 (-2H), C_{16} 12.2 (-2H), C_{18} 33.5 (-2.2H), C_{20} 26.6 (-.7H), C_{22} 5.5 (> -2.7H).

Fatty acids arranged in molecular groups

	C_{10}	C_{12}	C_{14}	C_{16}	C_{18}	C_{20}	C_{22}
Head cavity oil	6.7	36.5	30.1	16.9	7.4	2.4	---
Head oil*	3.5	20.0	28.0	23.0	19.0	6.5	---
Bone oil	0.6	3.3	10.5	33.0	28.7	19.5	4.4
Blubber oil*	---	1.0	9.0	33.0	37.0	19.0	1.0
Large intestine oil	---	1.6	7.2	24.2	34.9	26.6	5.5

* by T. P. Hilditch and J. A. Lovern

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3.26 CANADIAN REFRIGERATOR CAR PASSES TEST

Anonymous
Ice and Refrigeration 125, No. 2, 40 (August, 1953)

A Canadian Pacific mechanical refrigerator car recently carried 43,000 pounds of frozen halibut from Vancouver, B. C. to Montreal, Quebec in the most successful test yet run. The fish when taken from storage for loading were at +15°F. The test car was precooled to -10°F prior to being loaded, and the car thermostat was set to maintain this temperature in transit. Outside temperatures encountered in crossing the Canadian prairies ranged from 46° to 87°F. The fish when unloaded at Montreal were at -9°F.

Mechanical refrigerator cars are designed to carry all types of loads at temperatures ranging from -10° to 65°F. as long as the outside temperatures remain in the range -40° to 110°F. The refrigerator car test was conducted jointly by the C.P.R., C.N.R., and the National Research Council.

 ABSTRACTER: Martin Heerdt

NORWEGIAN MINKE WHALING

FATTY ACID COMPOSITION OF SPERM WHALE OIL

FREEZING FISH AT SEA

REFRIGERATED RAILWAY CAR

1.95

Norwegian whale catchers have been landing some meat at North Shields, England.

As a result of a ready market for whale meat the industry has continued to expand within the bounds imposed by government control and supervision. An average-sized minke whale will yield about 1,300 kilograms of meat and 400 kilograms of blubber with a landed value of roughly 2,000 kroner (about $280.00). Average yearly catches of small whales from the Norwegian coast during the years 1938 to 1950 inclusive were 1,980 minke whales, 27 killer, 54 bottlenose, and 9 non-specified whales. The killer and bottlenose whales are less desirable as the meat is of a poorer quality and must be used exclusively for animal food. Large whales such as blue, finback and sei whales are also taken along the Norwegian coast but are not included in the catches. Whalers are licensed to take either large or small whales but not both.

The "minke" whale also goes by a great variety of other names, which include: little piked whale, sharp-headed finner, lesser rorqual, pollack whale and Davidson's whale. Strictly speaking, "Balaenoptera acutorostrata" refers to the North Atlantic form only, while its counterparts in other localities may be found in temperate and polar waters throughout the world. Small fisheries for minke whales are also conducted by the Japanese and Russians.

The appearance of minke whales off the Newfoundland coast coincides with the inshore movement of capelin, which usually reaches its peak in June. One whaling firm in Newfoundland processed 153 minke whales at its shore station during the seasons 1947 to 1951, inclusive. The meat is sold as "Arctic Steak" or as mink and fox food.

Although minke whales are frequently seen by whalers off the west coast of Vancouver Island, they remain unmolested because of their small size and small oil yield.

3.234

Eviscerating, or at least bleeding, was found necessary prior to freezing; otherwise the thawed flesh was badly stained with blood. Eviscerated cod that had been held at deck temperature for 24 hours in January, 1952 or for 6 days in ice prior to freezing, yielded acceptable products provided the temperature of storage was no higher than -30°C. (-22°F.). A large number of samples of eviscerated cod that had been iced for 1 to 3 days prior to freezing and stored for 3 months at -30°C. (-22°F.) were rated very good in quality.

The effect of storage temperature on quality was very noticeable. Even one month at -20°C. (-4°F.) was detrimental to quality; therefore, storage of the frozen fish at -30°C. (-22°F.) while the vessel is at sea not only provides a superior product but also permits wider variation in treatment prior to freezing. Holding back large catches for a few days in ice to even out the flow to the freezer now appears quite feasible.

2.3 SKINNING FISH

Anonymous
Food Manufacture 28, No. 6, 251 (June, 1953)

According to this invention the extreme end of a fish fillet is gripped by a device which draws the fillet past a knife, and the knife is first moved to cut substantially perpendicularly through the flesh close to the extreme end as far as the skin and is then rocked to a smaller inclination to cut between the flesh and the skin as the fillet is drawn past it.

Preferably the extreme end is nipped between a large and smaller roller, the skin of the fillet being towards the large roller, and the knife first swings in an arc about the small roller and is then rocked in a contrary direction while its edge is maintained at a substantially constant distance from the large roller, and the fillet is then drawn between the rollers.

The method may also be applied to the skinning of flat fish such as plaice before they are filleted.

British Patent 683,867. Fisadco Limited.

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2.41 TRANSPORT AND SHIPPING

Anonymous
Modern Refrigeration 56, No. 663, 225 (June, 1953)
Ice and Refrigeration 125, No. 1, 22 (July, 1953)

A new, iceless, 160-pound capacity, refrigerated fresh fish container (illustrated, this card, over) is presently being tested by the Canadian National Railways for use in providing inland retailers with better quality fish. This less-than-carload quantity container was recently demonstrated at the annual meeting of the Fisheries Council of Canada.

When loaded with fresh fish that has been pre-chilled, the experimental container is able to maintain 29°F. for periods in excess of 3 days with less than 1°F. variation. The unit is constructed of double-walled aluminum, the space between the walls being filled with block insulation. In place of ice, the container is provided with a number of removable, refrigerated, aluminum plaques that completely screen the contents from outside heat. The refrigerant within each plaque is an aqueous eutectic solution of sodium sulfate contained in sealed rubber tubes.

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 ABSTRACTER: Martin Heerdt

2.113 THE CORROSION OF MILD STEEL MOVING RAPIDLY IN SALT SOLUTIONS AND NATURAL WATERS

Wormwell, F.; Nurse, T. J.; and Ison, H. C. K. (Department of Scientific and Industrial Research, Chemical Research Laboratory, Teddington, Middlesex)
Journal of Applied Chemistry 3, Part 6, 275-280 (June, 1953)

The present paper is concerned with the influence of movements at speeds up to 32.7 ft./sec. (about 20 knots) on the rate of corrosion of uncoated pieces of mild steel when using a high-speed rotor apparatus. A few experiments were carried out with small cylindrical pieces at speeds of 6.5 ft./sec., a few with 5-inch-diameter rings at 32.7 ft./sec. and the main work with 1-inch square flat pieces at 32.7 ft./sec.

The cylindrical pieces used in test number 1 were 2.5 cm. in diameter, 1.9 cm. in thickness and were prepared from normalized mild steel of the following composition: C 0.14, Si 0.13, Mn 0.39, S 0.022, P 0.34, Ni 0.24, Cr trace and Cu 0.07 percent. Each specimen was screwed to the lower end of an ebonite-covered steel spindle of the same external diameter as the specimen, the end of which was coated with a gutta-percha/paraffin-wax mixture leaving only the cylindrical turned surface exposed to the corroding liquid. The findings are summarized in Table 1, omitted. At a peripheral velocity of 6.5 ft./sec. the steel was practically uncorroded after 56 days in distilled water at 18°C., only slightly corroded after 50 days in mains water at 18°C., and severely corroded after 25 days in natural sea water and in 0.5-N sodium chloride solution at 18°C. Corrosion in sea water, however, took place much less rapidly, a difference that is ascribed to the restrictive action of magnesium hydroxide and calcium carbonate precipitated at the cathodes.

In test number 2 the outer surface of specimens in the form of a ring 12.7 cm. (5 inches) in diameter, 1.0 cm. wide, cut from a mild-steel tube, and attached to the end of

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 ABSTRACTER: Martin Heerdt

2.01 MILKINESS OF HAKE

Anonymous
Report of the Food Investigation Board (Great Britain) for 1952, 31-32 (1953)

To learn more about milky hake the Torry Station sent a commercial trawler to the North African fishing grounds during 1952. From 5 to 14 fish, fully identified as hake, were examined for "milkiness" at each of six specified stations, immediately after lifting the trawl and again at intervals until 24 hours after storage in ice.

About 40 percent of all hake populations examined were "milky." In every sample in which "milkiness" was observed, Chloromyxum thyrsites was found in the muscle tissue. In no instance was the parasite found in normal muscle tissue, the gall bladder or the liver. External examination of the hake at the time of catching or soon thereafter did not reveal the presence of parasitized fish. However, muscle tissue of the specimens that subsequently did become "milky" had a soft pulpy texture, and the flesh on being cut open had a glistening, jelly-like appearance without any indication of muscle fibers. Yeasts or fungi were not found on the parasitized fish, but two strongly proteolytic strains of bacteria were isolated. It is not known if these microorganisms are active in the production of "milkiness."

 ABSTRACTER: Martin Heerdt

FISH SKINNING MACHINE

CORROSION STUDIES

TRANSPORTATION OF FRESH FISH

MILKINESS IN HAKE

2.113

the spindle, were exposed to various solutions held at 25°C. Rotation at 1500 r.p.m. (32.7 ft./sec.) showed that corrosion was much less rapid in sea water than in 0.5-N sodium chloride (figure 1, omitted).

Test number 3, the main series, was conducted with flat pieces, each 2.5 cm. square, 0.8 cm. thick, and held in a specially designed ebonite holder, which unless otherwise indicated was rotated continuously at 1500 r.p.m. (32.7 ft./sec.) in a solution maintained at 25°C. Specimens were cut from ships'-plate mild steel. Results of the comparative tests in 0.5-N sodium chloride, natural sea water, and artificial sea water appear in figure 2, omitted. The specimens were removed and replaced at intervals by new specimens to obtain data for the construction of weight-loss/time curves, but the solution remained unchanged throughout the experiment. A comparison of curves B and C with curve A, all of which are based upon 0.5-N sodium chloride, shows the restrictive influence of magnesium and calcium salts in sea water.

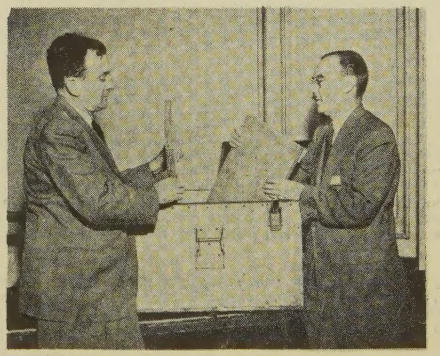
Depth-of-penetration/time curves for mild steel in natural sea water appear in Figure 3, omitted. The findings indicate that unprotected mild steel moving at 32.7 ft./sec. in natural sea water may be corroded at the rate of at least 1.7 mm. (67 mils) and possibly at 4.1 mm. (160 mils) per year. This is equal to the perforation of a 1/4-in. (6.35) ships' plate in 3.7 or 1.6 years, respectively.

In 7-day tests with milled mild-steel specimens in 0.001- to 0.5-N sodium chloride, the rate of corrosion or weight loss increased considerably with rise of concentration (figure 4, omitted) as did the maximum depth of penetration (figure 5, omitted).

Evidence of the formation of a passivating film at high speeds of movement was obtained by electrode-potential measurements of the steel during movement in mains water.

2.01 (Cross Reference: 1.5)

2.41



3.231 AN AIR BLAST FREEZER FOR RESEARCH

Mutch, R. L. and Eddie, G. C. (Torry Research Station, Aberdeen, Scotland)
Modern Refrigeration 56, No. 664, 234-238 (July, 1953)
Report of the Food Investigation Board (Great Britain) for 1952, 32-33 (1953)

An air-blast freezer designed and equipped for experimental use has been installed at the Torry Station. The freezer actually is an enclosed wind tunnel in which air is drawn over a three-bank, finned-tube ammonia evaporator by a 4-h.p. 5000-c.f.m. axial-flow fan discharging into a diffuser. The minimum air temperature available is -42°C. (-45°F.); the maximum air speed is 50 feet per second. Humidity may be varied somewhat without regard for the temperature.

Refrigeration for the tunnel is provided by two 9-h.p. compound ammonia compressors. The maximum heat removal capacity at an air temperature of -29°C. (-20°F.) is 30,000 B.t.u. per hour or the equivalent of freezing 125 pounds of fish per hour. Heating elements having a total input of 15 kw. are also provided in the event that an artificial test load is desired.

The tunnel is insulated with 6 inches of cork slab which is covered on the inside with aluminum-faced plywood and on the outside with resin-bonded plywood over bitumen. Three loading compartments are provided at floor level. Each compartment will hold a freezer truck capable of carrying 32 stones (1 stone = 14 pounds) of fillets or 16 stones of herring on trays for commercial-scale operations. Maximum air speeds are obtainable only after the loading zone has been reduced in cross section from 900 sq. in. to 225 sq. in. by the use of an appropriate reduction piece and diffuser.

The walls of the tunnel contain grooves for positioning various instruments at 3 different levels without entering the tunnel. In addition, one of the slides permits movement in any direction. The doors to the three compartments are provided with lights to illuminate the tunnel interior and with plugs connected to a panel for instrument and

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 ABSTRACTER: Martin Heerdt

3.238 BOSTON FIRM SOLVES PACKAGING PROBLEM

Anonymous
Canner 117, No. 4, 26 (July 27, 1953)

A Boston catering firm is using liquid-tight paper containers to retail their fresh clam chowder. More than 25,000 pints are sold each month and sales are said to be climbing.

Retailing fresh chowder calls for an inexpensive container that will prevent contamination for at least forty-eight hours. The inexpensive, rigid containers that were adopted late in 1946 solved all contamination problems: contamination of packaged clam chowder from outside sources; contamination (or flavoring) of the chowder from foreign substances or chemicals; contamination of adjacent merchandise (especially butter) as the result of chowder loss from an inadequately sealed package. The double-ply thickness and virgin pulp in liquid-tight containers offer resistance to rough handling and withstand normal cooking and freezing temperatures -- from 212°F. to well below 0°F. The slip-on lids save hours of packing time, but the containers, which are standard measures by the Bureau of Weights and Measures, can be filled to the top while a perfect, all-around closure completely covers the lips of the containers.

 ABSTRACTER: Kathryn L. Osterhaug

3.249 HUMIDITY IN COLD STORAGES

Symposium
Refrigerating Engineering 61, No. 6, 634 (June, 1953)

A symposium on "The Control and Measurement of Humidity in Cold Stores" is published in the 1951-52 Proceedings of the British Institute of Refrigeration, recently released. The six papers and ensuing discussion made up a meeting program of the Institute and are published in full.

CONTROL OF THE MOISTURE CONTENT OF AIR
Hendry, R. (Royal Technical College, Glasgow)

This is a theoretical article covering properties of air and water vapor mixtures, mass transfer between water and air, and behavior of materials in cold storage under conditions of low humidity, variable relative humidity, and high humidity.

HYGROMETRY IN COLD STORES
Griffiths, Ezer

This paper surveys the attempts that have been made to produce a simple instrument for the measurement of humidity for use at temperatures below the freezing point of water. The limitations of the wet and dry bulb hygrometer, the dew point apparatus, and the hair hygrometer are reviewed. Developments in electrical resistance hydrometers, the fog hygrometer, and others are briefly described.

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3.249 COLD STORAGE OF FROZEN "WHITE" FISH

Anonymous
Report of the Food Investigation Board (Great Britain) for 1952, 35 (1953)

It has now been confirmed that the quantity of expressible fluid in thawed fish increases rapidly during the first few months of cold storage at -10° and -20°C. (14° and -4°F.). After the initial storage period the quantity of expressible fluid remains fairly constant with larger amounts being available at the higher storage temperature. Attempts will be made to determine the reasons for this difference.

During the brining of thawed fish for smoking it was discovered that the samples responded to the brine according to the temperature at which they had been stored. Fresh fish were also brined for comparison with thawed fish. Brine was absorbed more rapidly and there was a greater loss of nitrogenous substances to the brine by fish that had been frozen and thawed than by fresh fish. These differences were more noticeable in frozen fish that had been held at -10°C. (14°F.) than in fish that had been held at -30°C. (-22°F.). By altering the brining conditions, however, it was possible to obtain equal absorption of salt and loss of nitrogen irrespective of whether frozen cod stored at -10°C. (14°F.) or fresh cod was brined.

The appearance of the smoked product prepared from frozen cod, however, still requires improvement. Much of the frozen fish used in the brining and smoking studies had been stored for long periods at rather high frozen storage temperatures. The suitability of similarly stored fish for smoking will be studied further by using different brining procedures.

 ABSTRACTER: Martin Heerdt

EXPERIMENTAL AIR BLAST FREEZER

HUMIDITY IN COLD STORAGE

PAPER CONTAINERS FOR CLAM CHOWDER

STORAGE OF FROZEN "WHITE" FISH

3.249

HUMIDITY CONTROL IN EGG STORAGE
Brooks, J. (Low Temperature Station for Research in Biochemistry and Biophysics, University of Cambridge)

This short article summarizing current knowledge and usage is divided into three major sections covering the evaporation of water from eggs, the storage of eggs, and the oiling and storage of eggs.

CONTROL OF RELATIVE HUMIDITY IN REFRIGERATED SPACES ON BOARD SHIPS
Stott, J. R.

Chilled beef, cheese, and apples, are used by the author to illustrate his point that "the most important factor influencing the humidity is the water characteristic of the cargo itself--the readiness with which it loses water and the equilibrium relative humidity it establishes if left in undisturbed air." Humidity is controlled on board ship by original design of the ship, by the method of operation of the refrigeration equipment, and by the method of packaging.

TEMPERATURE AND HUMIDITY IN COLD STORES AND THE LOSS OF WATER FROM STORED PRODUCE
Mann, G. (Ditton Laboratory, Department of Scientific and Industrial Research)

This paper shows how loss of weight from produce in a store is influenced by such factors as the surface area and temperature of the cooler coil, the rate of air circulation, heat leakage into the store, and, with fruit and vegetables, their rate of heat production. A means of determining the pipe surface area for a cooler which results in the reduction of drying to the most economic minimum is also suggested. No attempt is made to calculate the humidity gradients in a stack of produce.

THE DRYING OF FISH IN COLD STORE
Banks, A. (Department of Scientific and Industrial Research, Torry Research Station)

The heat which leaks into a cold store during normal operation is, according to the author, the primary factor causing drying, with the method employed for disposing of the heat having a secondary effect. It would appear possible, he says, on theoretical grounds to reduce drying by modifying the accepted design of cold stores so that the actual prevention of heat penetrating into storage chambers should be the maximum.

3.231

thermocouple leads. Ten leads are available for the measurement of air temperatures and 24 leads are available for the measurement of fish temperatures. Air speed and pressure drops are measured by Pitot tubes and by an electrically-driven micromanometer. Plate 1, below, is a general view of the freezer; figure 1 is a diagrammatic elevation.

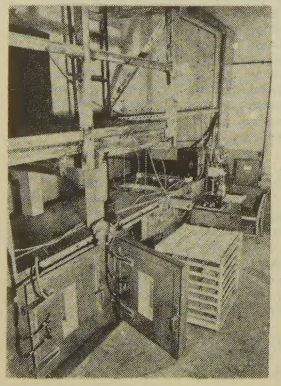
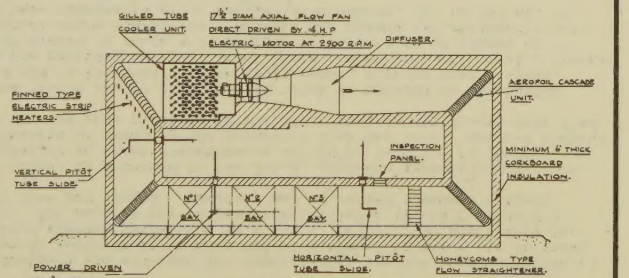


Plate 1.--General view of air blast freezer, showing trolley, instrument desk, Pitot tube slide and permanent instrument leads.

Fig. 1.


GILLED TUBE COOLER UNIT
17½ DIAM AXIAL FLOW FAN DIRECT DRIVEN BY ¾ H.P ELECTRIC MOTOR AT 2900 R.P.M.
DIFFUSER.
AEROFOIL CASCADE UNIT.
FINNED TYPE ELECTRIC STRIP HEATERS.
INSPECTION PANEL.
MINIMUM 6" THICK CORKBOARD INSULATION.
VERTICAL PITOT TUBE SLIDE.
No1 BAY
No2 BAY
No3 BAY
POWER DRIVEN PITOT TUBE.
HORIZONTAL PITOT TUBE SLIDE.
HONEYCOMB TYPE FLOW STRAIGHTENER.

DIAGRAMMATIC ARRANGEMENT OF AIR BLAST FREEZING TUNNEL.

SCALE IN FEET

6.131 ANNUAL REVIEW OF LITERATURE ON FATS, OILS, AND SOAPS. I.

Piskur, M. M.
Journal of the American Oil Chemists' Society 30, No. 5, 197-212 (May, 1953)

Expellers, vibratory screens, vacuum driers, coagulating chambers, tube driers, and solvent extractors as found on new whale factory ships are reviewed (Anon.--Internatl. Chem. Eng. 33, 28).

With fish liver oil, the dominant aim is to produce an oil of high vitamin A potency. In two descriptions (Suzuji -- Japan 37 ('51); Shimizu & Yamada, Bull. Research Inst. Food Sci. Kyoto Univ. No. 5, 29) new livers are immediately treated with alkali. In transit and during storage the alkali acts as both a preservative and as a digesting agent which releases the oil. For the same purpose, Rubenger (Pharm. Zentralhalle 91, 111) immediately freezes the liver to -15 to -18° in containers filled with carbon dioxide. These livers when minced and thawed in water can be centrifuged to produce good quality vitamin oil. Koike (Japan 1117('51)) claims that comminuted liver when heated with high-frequency current releases vitamin A fractions of different potency depending on the current being used. The method is patented as a simple method for obtaining fractions of high vitamin A content.

Very favorable results are reported on production of vitamin A from whale-liver oil by molecular distillation followed by more intensive concentration by chromatographic technique (Agawa et al.--J. Oil Chemists' Soc. Japan 1, No. 1, 12).

The sterols of wool fat and fish oils are also removed by formation of complexes with zinc chloride that are insoluble in organic solvents (Schuppen en Zoon--Fr. 962,606).

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6.193 FURTHER EVIDENCE FOR AN UNIDENTIFIED HATCHABILITY FACTOR IN CONDENSED FISH SOLUBLES

Arscott, G. H. and Combs, G. F. (University of Maryland, College Park)
Poultry Science 32, No. 4, 730-733 (July, 1953)

Approximately 200 New Hampshire pullets were fed the basal ration described in Table 1, this card, over, in an experiment originally designed to accurately determine their vitamin B_{12} requirements. To increase vitamin B_{12} depletion, 0.5 gram of iodinated casein (protamone) was added per 100 pounds of ration for a 13-week preliminary period. Individual hatchability, fertility, and egg production records obtained during the first 7 weeks of the preliminary period were used as a basis for dividing the pullets into five comparable groups of 15 birds each. Groups 1 to 4 were housed in pens with raised wire floors and no litter, whereas group 5 was housed in a similar pen on litter.

All known essentials except vitamin B_{12} are considered to be present in adequate amounts in the basal ration (Table 1). This ration was supplemented so that groups 1, 2, 3, 4, and 5 received 0, 0.5, 0.75, 1.0 and 1.25 micrograms of vitamin B_{12} per pound of ration, respectively, during the first 11 weeks (period I) of the experimental period; 0, 0.4, 0.6, 0.8, and 1.0 micrograms, respectively, during the next 12 weeks (period II) of the experimental period; and 0, 0.4, 0.6, 2.0, and 0 micrograms, respectively, during the last 6 weeks (period III) of the experimental period. Groups 1 and 5 received 3% condensed fish solubles in place of vitamin B_{12} during the last 6 weeks of the experimental period.

By the end of the first 23 weeks, fertile eggs from groups 1, 2, 3, 4, and 5 had decreased from 82 to 17, 33, 47, 44, and 70 percent hatchability, respectively. These

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 ABSTRACTER: Martin Heerdt

7.80 ASSESSMENT OF QUALITY

Anonymous
Report of the Food Investigation Board (Great Britain) for 1952, 30-31 (1953)

Statistical analyses of panel findings showed that training made the numerical scoring behavior of a panel less erratic. To obtain better correlation between volatile base and sensory scores or trimethylamine values and sensory scores than was obtained in the previous year, North Sea and Norwegian cod similar in size were selected, and stored in ice for a period of 21 days under approximately identical conditions. Every 3 or 4 days during this interval both raw and cooked fish samples were scored organoleptically and analyzed for volatile base and trimethylamine. Altogether 12 raw fish and 24 cooked pieces of flesh from the same part of each fish were scored and 100 samples of flesh were analyzed. The findings indicated a curvilinear relationship between the volatile base and trimethylamine values and the time of storage. They also indicated that the scatter in chemical values, both between individual fish stored in ice for the same period and between different cuts of the same fish, increases with the duration of storage, to the extent of about 100 times after 21 days.

The sensory and chemical scores did not indicate any differences in the rate and course of spoilage that can be attributed to differences in sex. Differences in the extent of spoilage due to sex may exist, however, if other factors such as season, sexual maturity, etc. are considered.

One comparison of the effect of size on the rate of spoilage in iced, gutted cod in the range 38 to 56 cm. and 56 to 82 cm. in length showed no significant difference in bacterial counts between the two lots of fish over a 17-day period of storage. Significant

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 ABSTRACTER: Martin Heerdt

8.69 OCCURRENCE OF VITAMIN E

Brown, F. (Hannah Dairy Research Institute, Kirkhill, Ayr.)
Nature 171, No. 4357, 790-791 (May 2, 1953)

Many animals on a diet that is low in vitamin E show signs of vitamin E deficiency when the diet is supplemented with cod-liver oil. This observation has sometimes led to the erroneous assumption that vitamin E is not present in fish liver oils.

Preliminary examintion by the non-specific method of Emmerie-Engel showed 25.6, 30.2, and 32.2 mg. total tocopherols per 100 grams of cod-liver oil. A more specific method was then used to determine the tocopherol content of 5 other fish liver oils.

The unsaponifiable material was obtained from the oils by alkaline hydrolysis in the presence of pyrogallol. After the removal of carotenoids, vitamin A, and sterols, the remaining unsaponifiable material was concentrated and chromatographed on "Vaseline"-coated paper using 75 percent ethanol or 90 percent acetic acid as the developing solvent or on silicone-impregnated paper using 70 percent ethanol. Spraying with α,α'-dipyridyl and ferric chloride revealed the presence of a substance which had the same R_F value as α-tocopherol under the variety of conditions described. A mixture of α-tocopherol and the aforementioned concentrate was also chromatographed. This mixture when developed on the chromatogram gave only one spot.

The tocopherol content of the five other fish liver oils examined by the chromatographic method are tabulated, this card, over.

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 ABSTRACTER: Martin Heerdt

FISH OIL EXTRACTION

ASSESSMENT OF QUALITY

HATCHABILITY FACTOR IN FISH SOLUBLES

VITAMIN E IN FISH LIVER OILS

7.80 (Cross Reference: 7.81)

differences indicating more rapid spoilage in the smaller fish did appear, however, after the 13th day in both the organoleptic and the chemical findings. If the ratio of the surface area to the volume of the fish is compared the reason for more rapid spoilage in the smaller fish is apparent.

8.69

α-Tocopherol Content of Fish Liver Oils

Liver oil	α-Tocopherol (mg./100 g. oil)
Cod	25.6, 30.2, 32.2
Angler fish	31.9
Blue skate	25.3
Haddock	18.0
Ling	27.2
Turbot	45.0

In every instance examination of the paper chromatogram revealed the presence of α-tocopherol. No other substance reducing ferric chloride was found in the concentrates. These findings apparently indicate that α-tocopherol is a normal constituent of fish liver oil. Robeson and Baxter (1943) observed that α-tocopherol occurs in two different shark-liver oils, dogfish, and Californian jewfish.

The results obtained with cod liver oil confirm the observations of Dam (1945) and Blaxter (1952), both of whom reported that the typical signs of vitamin E-deficiency produced in animals receiving oil in their ration are not due to a vitamin deficiency but to the presence of highly unsaturated acids in the oil.

6.131 (Cross Reference: 6.230)

6.193

findings indicated that an unknown factor apparently was limiting hatchability, but that this factor was supplied in part from the litter. During the last 6 weeks, fertile eggs from groups 1 and 5 increased from 17 to 70 percent hatchability, respectively, to 77 and 84 percent hatchability, respectively; whereas hatchability for groups 2, 3, and 4 remained low. The improvement in hatchability in groups 1 and 5 is attributed to the presence of an unidentified factor in condensed fish solubles.

TABLE 1.—*Composition of basal ration*

Ingredient	Percent
Ground yellow corn	48.0
Crushed wheat	30.0
Corn gluten meal	4.0
Soybean oil meal, solvent, 44% protein	12.0
Ground limestone	2.0
Defluorinated rock phosphate (14% P, 34% Ca)	3.5
Iodized salt	0.5
Manganese sulfate	0.025
A & D Feeding Oil (300 ICU vitamin D, 2,250 IU vitamin A per gram)	0.3
Choline chloride, 25% mix	0.12
	Mgt./lb.
Riboflavin	1.2
Calcium pantothenate	1.2
2-Methyl 1, 4-naphthoquinone	0.2

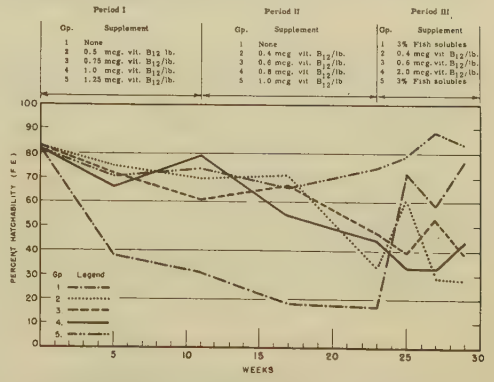

FIG. 1. Effect of vitamin B_{12} levels and condensed fish solubles on hatchability of fertile eggs. Group 5 was on litter, Groups 1-4 on raised wire floors.

7.50 SOME TYPICAL ANALYSES OF RED SEAWEEDS

Ross, Alan G. (Chemistry Department, University of Edinburgh)
Journal of the Science of Food and Agriculture 4, No. 7, 333-335 (July, 1953)

All analyses were carried out on dried milled samples. Moisture and volatile matter were determined by drying to constant weight at 105°C. All other values are presented on the dry weight basis. Total sulfate was determined by precipitation with barium chloride after 5 hours of hydrolysis with 30 percent HCl. Ash was determined by igniting at dull red heat to constant weight. Nitrogen was found by the micro-Kjeldahl method. Fats and pigments soluble in boiling carbon tetrachloride were obtained after 18 hours of Soxhlet extraction followed by solvent removal and weighing. Alcohol-soluble matter was obtained by extracting the residue from the fat extraction for 18 hours with boiling ethanol, drying, and weighing.

Uronic anhydride was determined by distillation with 19 percent HCl and adsorption of the CO_2 produced in NaOH solution according to the method of McCready, Svenson & Maclay. Cellulose was arrived at by the method used for the determination of residual fiber, i.e., successive boilings with acid and alkali and weighing of the insoluble matter. Total reducing sugars were obtained by hydrolyzing with N-H_2SO_4, neutralizing with $BaCO_3$, filtering, washing, and making up to an appropriate dilution prior to determination by means of alkaline hypoiodite solution. Results were calculated to either anhydro-hexose or -pentose depending upon which predominated.

Results of the analyses appear in Table I, over. Table II, over, shows the distribution and abundance of the sugars based on visual estimates of the intensities of sugar spots on chromatograms carried out on the hydrolyzates of the samples. Strong, medium, weak, and trace correspond to over 80, 10-50, 5-10, and less than 5 percent sugar, respectively.

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 ABSTRACTER: Martin Heerdt

7.80 NOTES ON PLANK'S RATIONAL METHOD OF GRADING FOOD QUALITY

Ehrenberg, A. S. C.
Food Technology 7, No. 4, 188 (April, 1953)

Numerical grading or scoring systems are continually used in sensory tests of food, but few writers have attempted to discuss the underlying rationale. An apparent exception is R. P. Plank to whose "Rational Methods for Grading Food Quality" favourable reference continues to be made. Plank's arguments, however, involve certain unresolved difficulties or errors and it may be worthwhile to draw attention to them here.

Plank introduces three concepts as follows: (a) descriptive terms running from "perfect" to "unacceptable," (b) a "quality-percent" varying from 0% to 100%, and (c) numerical grades, from 0 to 10.

However, as far as one can see Plank does not give these three concepts separate identities. Sometimes grades appear equivalent to the descriptive terms, but a number of graphs are also given on which quality-percent and the descriptive terms are plotted together on one axis, against the grades on the other. More generally, Plank's grades seem synonymous with his descriptive terms and with his quality-percent. Naturally enough, Plank's chosen grading system gives a straight line when plotted against his quality-percent whilst for grading systems other than his own "the line correlating grade and quality deviates very much from the desired straight line." Plank's criticism of other people's grading systems seems therefore to arise solely from his own confused verbal definitions.

More important than this confusion is Plank's apparent assumption that quality has already been quantitatively measured. Thus, "the fundamental supposition of any rational grading is that the number expressing the grade be proportional to the quality of the property to be measured." Or again, "an equal difference in grade numbers must correspond

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6.52 RESULTS OF EXPERIMENTS ON RATIONS WITHOUT HORSE MEAT

Watt, Phyllis R. (Oregon Agricultural Experiment Station, Corvallis, Oregon)
Black Fox Magazine and Modern Mink Breeder 37, No. 1, 8-9, 20-23 (May, 1953)

Results and observations gained from mink feeding experiments conducted at the experiment station fur farm during 1952 indicate that progress has been made toward the removal of red meats from mink diets. All work was concentrated on reducing the quantity of slaughterhouse byproducts and red meats in ranch mink rations by increasing the quantity of fish and by using other dietary supplements.

Methionine improved the quality of male pelts when included as a dietary supplement in quantities not exceeding 0.05 percent of the dry weight of the diet. Caution must be used, for an excess of methionine is toxic to mink. Soybean meal proved to be of value in pelter rations in combination with methionine and aureomycin. Growth rations, however, were not improved by the addition of more than 2 percent soybean meal to the wet diet. Live yeast at the rate of 1/2 percent of the weight of the wet diet was advantageous in improving growth but the color of the resulting animals was not desirable.

Antibiotics in mink rations were advantageous primarily because they kept down enteritis and scouring which are common with high-fish rations. Their most efficient level was around the equivalent of 2 1/2 pounds of a commercial aureomycin product per ton of wet feed during the growing period, 1 to 1 1/2 pounds during furring out, and complete dietary removal from pelting through birth of the young mink.

Liver in the diet once a week in conjunction with a high-fish ration provided for adequate growth but failed to produce an acceptable pelt. Cooked rations provided

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 ABSTRACTER: Martin Heerdt

6.138 HYDROXYLATION: NEW UNIT PROCESS

Anonymous
Chemical Engineering 60, No. 8, 118-122 (August, 1953)

Two synthetic hydroxylated fats -- a butyl hydroxy-acetoxy ester and a butyl polyacetoxy ester -- are now being produced commercially for use as secondary vinyl plasticizers or as primary plasticizers for synthetic rubbers and cellulosic resins. The process used by the castor oil company producing the products is as follows:

1. The raw materials can be soybean oil or other vegetable oils, animal fats, mixed acids from these fats and oils, or pure fatty acids such as oleic acid.

2. The oils or acids are esterified in a bank of three 1,000-gallon reactors. After esterification, the excess alcohol is distilled off, and the esters are filtered with activated carbon and diatomaceous earth to remove sludge.

3. The hydroxylation is carried out in a 1,000-gallon stainless steel reactor that is equipped for heating or cooling by Dowtherm. The jacketed kettle has an anchor agitator with extra arms to mix immiscible mixtures that may form at the start. The peracetic acid is made first. The fatty esters are added by controlled addition when maximum peracetic acid formation is reached. The reaction is carried out at atmospheric pressure and at temperatures ranging from 50° to 80°C., depending on the product. Ester is added as fast as the liquid Dowtherm used for cooling can absorb the heat of reaction. After hydroxylation, the excess acetic acid is distilled off, and the product from the reactor is passed through a closed aluminum pressure filter to remove the acidic catalyst sludge. At this point, the butyl hydroxy-acetoxy ester can be removed.

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 ABSTRACTER: D. T. Miyauchi

ANALYSES OF RED SEAWEEDS

MINK RATION STUDIES

MEASUREMENT OF FOOD QUALITY

VINYL PLASTICIZERS FROM FATS AND OILS

6.52

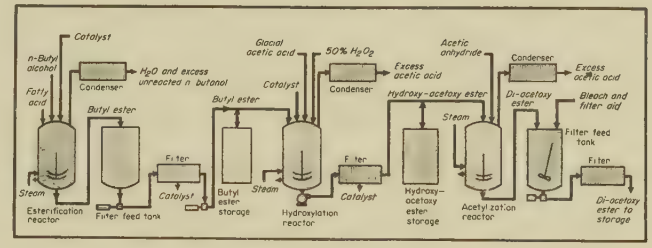
adequately for the nutritional needs of growing mink only when fed on a temporary basis.

Copper as a dietary supplement failed to overcome a definite reddish tinge commonly seen in mink receiving diets containing large quantities of turbot.

Diets high in fish content and without red meats, when supplemented with animal and vegetable byproduct meals and with cereals gave promising results, particularly when considering pelter rations.

6.138 (Cross Reference: 4.89)

4. To make butyl poly-acetoxy ester, the hydroxy-acetoxy ester is acetylated with acetic anhydride in a bank of three 1,000-gallon aluminum stills at a liquid temperature of 130° - 140°C. When acetylation is completed, the acetic acid and anhydride are distilled off. After bleach and filter-aid have been added, the mixture is filtered through an aluminum plate-and-frame press.



7.50 (Cross Reference: 6.3)

Table II

Species	Source	Galactose	Glucose	Xylose	Mannose	Fucose
Corallina officinalis	North Berwick, 6/11/52	Medium	Trace	Trace	—	Trace
Rhodochorton floridulum	Plymouth, 1/11/52	Medium	Weak	Strong	—	—
Rhodymenia palmata	"	"	"	"	—	—
Alaria spp.	"	Strong	"	"	—	—
Galidium pristoides	"	"	Trace	Weak	Trace	Trace
" *cartilagineum*	"	"	"	"	"	Weak
" *coulteri*	"	"	Weak	"	"	Trace
Sakira ritada	"	"	Trace	"	"	Weak
Gracilaria confervoides	"	"	"	"	"	Trace
" *foliifera*	"	"	Trace	Trace	"	Weak
Furcellaria fastigiata	"	"	Trace	Weak	Trace	Weak
Phyllophora membranifolia	"	"	"	"	"	Trace
Porphyra umbilicalis	"	"	Weak	"	Weak	Weak
Ceramium rubrum	"	"	"	Weak	Trace	Trace
Dilsea edulis	"	"	Strong	"	"	Weak
Iridaea laminaria	"	"	Trace	Trace	"	"
Polyphlaea nitrata	"	"	"	"	"	"
Membranoptera spp.	"	"	Weak	Weak	"	Trace
Phycodrys spp.	"	"	"	"	"	Weak
Pterocladia capillacea	"	"	Trace	"	"	Trace
Gigartina stellata	"	"	"	"	"	Weak
" *radula*	"	"	Trace	"	—	—
" *stiriata*	"	"	"	"	"	"
Chondrus crispus	"	"	Weak	"	Trace	Trace
Rhodoglossum affine	"	"	Trace	"	Trace	"

Table I

Species	Source	Ash	Total sulphate	Nitrogen	Fats and pigments soluble in CCl_4	Alcohol-soluble	Uronic anhydride	Cellulose	Reducing sugars
		%	%	%	%	%	%	%	%
Corallina officinalis	North Berwick, 6/11/52	30·0	0·5	1·5	0·4	3·6	4·5	5·1	10·8
Rhodochorton floridulum	Plymouth, 1/11/52	33·3	0·5	2·6	1·6	3·1	1·6	7·6	10·7
Rhodymenia palmata	North Berwick	21·2	0·7	3·5	2·4	7·9	3·3	2·4	(36·2 anhydro-pentoses 3·5 anhydro-hexoses
Alaria spp.	Plymouth, 4/11/52	25·6	1·6	3·9	0·7	3·1	3·4	8·8	41·4
Galidium pristoides	Strandfontein, S. Africa, 26/1/52	19·8	2·2	3·4	1·0	6·0	2·6	6·5	38·7
" *cartilagineum*	St. James, S. Africa, 26/1/52	22·6	2·4	3·3	0·8	4·8	2·4	9·0	33·9
" *coulteri*	California, U.S.A., 8/52	23·1	2·7	3·8	1·6	5·2	4·1	8·5	42·8
Sakira ritada	Kommetje, S. Africa, 10/4/52	18·9	2·9	3·8	1·1	6·2	2·9	7·9	40·9
Gracilaria confervoides	Langebaan, S. Africa, 10/6/52	31·0	2·8	3·8	1·1	6·4	1·6	3·8	32·0
" *foliifera*	Plymouth, 3/11/52	28·0	4·5	2·6	1·1	6·8	2·4	4·6	28·1
Furcellaria fastigiata	California, U.S.A., 8/52	28·6	4·3	2·9	2·7	4·7	4·6	8·2	31·6
Phyllophora membranifolia	Dunbar	34·4	4·4	4·1	1·2	7·0	1·2	4·7	30·0
Porphyra umbilicalis	North Berwick, 24/4/52	44·4	5·3	3·2	1·6	13·0	3·8	4·7	38·2
Ceramium rubrum	" 10/6/52	27·5	5·3	3·1	0·8	10·6	3·8	4·7	38·1
Dilsea edulis	Plymouth, 3/11/52	19·8	6·7	3·1	0·8	4·9	2·1	3·1	45·4
Iridaea laminaria	California, U.S.A., 8/52	18·1	7·8	3·4	2·6	2·2	2·4	1·0	31·3
Polyphlaea nitrata	North Berwick, 4/5/52	44·9	9·0	4·6	2·2	10·7	4·4	1·2	35·0
Membranoptera spp.	Dunbar	33·7	9·0	3·8	1·6	12·0	1·1	4·4	28·3
Phycodrys spp.	"	41·4	10·8	3·8	1·3	12·7	0·8	3·4	23·2
Furcellaria fastigiata	Galway Bay, 15/12/51	22·7	10·8	3·6	1·3	5·0	2·6	5·7	37·2
Gigartina stellata	North Berwick, 30/1/52	21·2	14·2	3·6	1·6	4·8	3·8	2·3	38·9
" *radula*	Kommetje, S. Africa, 6/6/52	28·3	18·2	2·7	0·5	3·6	1·5	1·8	35·2
" *stiriata*	Kommetje, S. Africa, 10/4/52	28·5	17·3	2·9	1·0	7·6	1·3	1·1	36·3
" *crenata*	California, U.S.A., 8/52	24·5	19·1	2·4	0·5	4·1	2·7	4·7	37·4
Chondrus crispus	Aberayron, 22/2/52	20·8	16·7	3·1	1·3	7·1	3·2	4·0	37·8
Rhodoglossum affine	California, U.S.A., 8/52	23·5	18·3	2·1	0·9	2·7	3·1	3·0	37·1

7.80

with an equal difference in quality." This assumes not only that it is already known what "an equal difference in quality" means and, presumably, that this meaning has been agreed to by different investigators, but also that such a state of affairs is both possible and desirable. That, however, is just the problem at issue.

Plank does not discuss how his concept of "quality" could be observed even qualitatively. Quantitatively, he considers that "it is reasonable to assume that the difference in quality between good and fair is equal to that between fair and poor." But neither the terms "good," "fair," etc. nor the conditions under which this "equality" is to hold are defined, nor is a general principle given by which differentiation could in fact be made. The statement, therefore, can neither be verified nor disproved.

The failure to give precision to the concept of "quality" appears in another form in the later sections of Plank's papers, where he defines an "integral grade" of quality as the sum of numerical assessments of different factors (i.e. odour, flavour, appearance, fat and mineral content, bacterial loads, etc.) variously weighted. Now Plank's account does not seem to allow for the direct observation of whatever it is that this "integral grade" might be supposed to represent or measure, so that again one cannot verify whether or not the integral grade is in any sense true or correct.

Lesser queries may occur to the readers of Plank's papers. For example, there is the fact that in making any measurements -- of length let us say -- one decides beforehand to measure only to the nearest inch, half-inch, or whatever it may be. On the other hand, there will also be those "errors of measurement" that become apparent in considering the reliability (as opposed to the sensitivity) of one's measurements. Should these two concepts be confused, as Plank seems to do?

Further comment on Plank's approach to the rationale of numerical scoring scales can hardly be made without introducing ideas not mentioned by him. Enough has perhaps been said here to indicate the paradoxical position of the subject when it is recalled that Plank was practically the only contemporary reference on scoring given in the review of the literature for the recent conference on "Sensory methods for measuring differences in food quality."

6.193 CHICK GROWTH FACTOR PRESENT IN FISH MEAL AND FISH SOLUBLES

Wiese, A. C.; Petersen, C. F.; Pappenhagen, A. R.; and Wycoff, H. D.
Federation Proceedings 12, No. 1 (Part I), 433 (March, 1953)

Day-old New Hampshire chicks were fed for a period of 4 weeks a purified diet (Diet I) containing isolated soybean protein (alpha protein), cerelose, fat, minerals, methionine, penicillin and crystalline vitamins. Preliminary investigation revealed that the soy protein was deficient in glycine but not lysine or arginine. Chick growth on Diet I averaged 300 gm. and on Diet II (Diet I plus 0.6% glycine) 330 gm. The addition of 3-6% fish solubles or 6% herring fish meal to either ration resulted in an increase in chick growth of approximately 50 gm. No further growth stimulation resulted from the addition of higher amounts of fish meal or fish solubles. The factor is also present in dried whey but not in various liver preparations. Attempts to isolate the factor from fish solubles have shown that it is soluble in water, dialyzable, insoluble in isobutanol, not absorbed by norite at pH 5.5, and not precipitated by basic lead acetate. It is stable to autoclaving for 30 minutes from pH 3.0-10.0 and is stable at pH 1.0-11.0 for 2 hours at room temperature. The factor is absorbed by ion exchange resins but under certain conditions it appears that the factor may be destroyed in the ion exchange process. Evidence has been obtained which indicates that the protein level of the diet has an effect on the response of chicks to this factor.

Reprinted in whole

6.190 PALATABILITY OF TURKEYS FED EXPERIMENTAL DIETS CONTAINING AUREOMYCIN AND FISH PRODUCTS

Swickard, Mary T.; Harkin, Alice M.; and Marsden, Stanley J. (Department of Agriculture, Washington, D. C.)
Poultry Science 32, No. 4, 726-729 (July, 1953)

The palatability of roasted turkey flesh has made necessary a re-examination of the diets fed to very young birds intended for roasting and frying. As previously reported, the flavor of turkeys 8 to 16 weeks old was adversely affected when 0.375 percent fortified cod liver oil was fed along with 14 percent whitefish meal in the starting diet (Marsden et al., 1952). Similarly, small but significant fishy and other off-flavors were present in 11- to 15-week old turkeys that had received 0.5 percent A and D feeding oil and 7.5 percent menhaden fish meal (Swickard et al., 1952).

In an attempt to eliminate fishy off-flavors, the present study used rations containing less fish meal and fish oil than in the preceding studies. The control turkeys received a typical all-mash starting ration containing 15 to 41 percent soybean meal, 18 to 43 percent ground yellow corn, 10 percent pulverized oats, 10 percent wheat middlings, 5 percent menhaden fish meal, 5 percent meat scraps, 5 percent alfalfa meal, 0.25 percent A and D feeding oil, 0.05 percent dry vitamin D, plus small amounts of limestone, bonemeal, salt, and riboflavin supplement. The turkeys on trial received the same ration plus 10 mg. of aureomycin hydrochloride per kg. of mash. At the beginning of the 15th week whole feed barley was offered free choice with the mash to all lots of turkeys. All turkeys used were of the Beltsville Small White variety brooded in a standard manner and reared in confinement at the Agricultural Research Center, Beltsville, Maryland.

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 ABSTRACTER: Martin Heerdt

2.01 ON A NEW SPOROZOA, HEXACAPSULA NEOTHUNNI GEN. ET SP. NOV., FROM THE MUSCLE OF YELLOWFIN TUNA, NEOTHUNNUS MACROPTERUS

Arai, Yoro and Matsumoto, Koichi
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 7, 293-298 (January, 1953)

Jelly meat or the jellied condition of swordfish has been known for a long time among fishermen and fish dealers since it is the cause of considerable economic loss. This phenomenon when reported in Canada by R. H. McGonigle and A. H. Leim (1937) was attributed to a sporozoan, Chloromyxum sp. The early "jellied" condition is characterized by soft, greasy, and almost liquefied muscle suggestive of mucus in the long cavity parallel to the backbone. In this condition the muscle was found to have a pH of 5.9 - 6.1 and to contain 20-26 mg. of volatile basic nitrogen per 100 g. of muscle, both of which are indicative of the beginning of spoilage.

Liquefaction of the muscle occurs very rapidly, and in some cases whole fish intact to begin with were decomposed in 24 - 70 hours at normal temperature. In the advanced stage the soft, creamy disintegrated muscle fills the entire large cavity of the fish. While the phenomenon is not commonly seen in recently-killed fish it may develop in some species by the time they reach the market. The presence of the jellied condition in live fish, however, while not verified is doubtful even if the phenomenon has been observed in fish shortly after they have been killed. Similar instances of jellied muscle tissue have been seen in halibut, turbot, swordfish, tuna, etc.

In August, 1952 a large number of jellied tuna that had been held in ice were discovered at the Tokyo market among other hauls from the Bunda Sea. When examined

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 ABSTRACTER: Martin Heerdt

2.1125 DRUM SEINING

Anonymous
Pacific Fisherman 51, No. 8, 25 (July, 1953)

A new type of purse seiner has appeared in the Puget Sound salmon fishery. These new seiners have had the turntable on the stern replaced by a drum upon which the seine is wound. These drum seiners are believed to be the answer to the manpower problem. They can be operated by 4 or 5 men instead of the 9 or 10 of the conventional seiner and can make a set in less time. Skippers of these boats claim they can make up to 10 sets a day and under good conditions can complete a set in 40 minutes.

In designing such gear there are four factors of prime importance: (1) There must be proper power for driving the reel. This must be sufficient to pull the seine out of the water. Provision must be made for variable speed in both forward and reverse directions. The boats now operating use gear, hydraulic, or electric drives. The gear drive using a truck transmission coupled to a power take off from the front of the main engine gives up to an 84 to 1 reduction and provides a greater torque than the other drives. The hydraulic and electric drives give easier and smoother control of the reel. However, few small boats have sufficient generating capacity for electric drives. (2) Free-wheeling must be provided so that the net will come off the reel and over the stern easily when making a set. (3) A good brake is necessary on the reel so that the net when in the water can be towed to the proper position in making a set. (4) The purse seine must be hung in a special way. The cork line, lead line and purse line should be all of approximately the same length, giving a "square hanging." This is done so that the net can be bunched and wound evenly on the reel.

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 ABSTRACTER: Keith A. Smith

GROWTH FACTOR IN MEAL AND SOLUBLES

NEW SPOROZOAN FROM TUNA MUSCLE

FISHY FLAVORS IN TURKEYS

DRUM SEINING

2.01 (Cross Reference: 1.1)

microscopically, Cnidosporidian spores were found in the affected portions. These particular spores are new to science and are described here under the name of Hexacapsula neothunni gen. et sp. nov. Numerous spores were found in the jellied muscle of yellowfin tuna in a state of diffuse infiltration but the cyst was not seen. The trophozoite stage was not found. Infections in other organs remain to be studied.

The spore is composed of six laterally-expanded and conical shell valves that are attached bilaterally to sutural plates of contiguous valves at the two sides of the base; the sutural plates of both sides form a 60° angle at the center of the spore, i.e. an hexagonal asterisk. There are six polar capsules at the anterior end, one in each valve. The sutural lines, while straight, were not clear, but the coils of filaments were distinctly observed. The shell surface is smooth. The central portion of the spore seems to be filled with a granular sporoplasm mass, and the protruded portion of the asterisk is regarded as vacuous. The iodinophilous vacuole was not observed; the nucleus was indistinct. In the fresh state the extruded polar filaments measured 14 to 18 microns in length, the spore measured 5.3 - 7.3 microns in length at the sutural diameter by 9.1 - 13.0 microns broad, and the elongated ovoid polar capsules measured 2.0 - 3.1 microns in length by 1.3 - 2.1 microns in diameter. Figure 1, below, shows the spore.

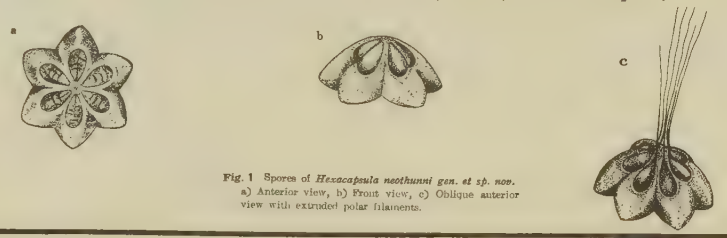

Fig. 1 Spores of *Hexacapsula neothunni gen. et sp. nov.*
a) Anterior view, b) Front view, c) Oblique anterior view with extruded polar filaments.

2.1125

Each installation has presented different problems in adaptation to the individual boat. The reels vary from 5 to 9 feet in diameter and the width depends upon how much space is available on the stern of the vessel.

In setting the seine most of it is run out in a straight line and then towed in either direction to complete the circle. The net, purse line, lead line, cork line and running line are then all reeled in together and the actual pursing is done only from the bag or tail end. Some of the seines have purse rings on only the tail 2/3 of the seine, and the other 1/3 is wound on the reel before pursing begins. When the purse rings have been drawn up to the boat they are picked up by a specially-shaped steel device called the clothespin. As the net is reeled in these rings are pulled off the clothespin and through the level wind device on the stern of the boat to the reel with the net.

6.190

At the end of 14 weeks, 20 males were dressed for storage, whereas 12 remaining males were continued on their respective rations for another 12 weeks before being dressed for storage. A total of 20 female birds also included in the feeding trials were dressed at the age of 16 weeks.

After slaughter the turkeys were slack-scalded at 126°F., picked by hand, refrigerated 4 days at 35°F. and eviscerated. The giblets and neck were wrapped and placed inside the body cavity after which the turkeys were vacuum-sealed into Cry-o-vac bags and stored at 0°F. The 14-week old males and 16-week old females were stored for 1 1/2 to 2 months and the 26-week old males were stored for 3 to 3 1/2 months at 0°F. before cooking.

Aureomycin hydrochloride as a supplement to the standard starting ration had no significant effect upon the eating quality of any of the roasted turkeys. The general quality of the flesh of all turkeys included was high. Some fishy and other off-flavors were present, however, in turkeys on both the control and the supplemented ration. Off-flavors were pronounced in the dark meat and the skin from the dark meat of 14-week old males and 16-week old females; but these pronounced off-flavors were reported less frequently in 26-week old males. In summary, the foregoing turkey starting rations are somewhat high in fish products for best results when producing immature turkeys for market.

8.64 MEAL AND STICKWATER FROM FRESH AND STORED HERRING

Anonymous
Meld. S.S.F., No. 2, 23-28 (1951)

In Norway, large quantities of herring have to be stored before they can be processed. Experiments were carried out to determine the seriousness of the consequent deterioration in quality of the meal and stickwater. Stickwater concentrates and herring meal were prepared from large herring after the fish had been stored for 2, 10, and 20 days. The products were analysed chemically and microbiologically (for vitamins of the B complex) and their values as supplements to a low protein diet fed to chicks were determined. The meals varied little in chemical composition, but greater changes occurred in the aqueous phase, as shown by the content of nitrogen fractions in the stickwater. Since there was little if any difference in the feeding value of meal manufactured from the fresh and stored herring, it appears that even after storage for 3 weeks, herring can yield a meal of as high protein value as meal from fresh herring. Stickwater from stored herring appeared to be about equal in value to that from fresh herring, and contained more riboflavin and vitamin B_{12}, but less pantothenic acid and niacin; the values were calculated on the basis of dry matter, and this increased during storage. As a source of vitamin concentrates, stored herring appears to be at least as good as fresh herring. The methods of preparing meal and stickwater at the pilot plant are described.

(The above abstract appears in Food Science Abstracts 25, No. 2, 146, March, 1953 and is reprinted here)

2.02 OBSERVATIONS ON RIGOR MORTIS IN WHALE MUSCLE

Marsh, B. B.
Biochim. Biophys. Acta 9, 127-133 (1952)

Most of the experimental material was from blue and fin whales (Balaenoptera musculus and Balaenoptera physalus), although sperm whales (Physeter Catadon) were also used. In the longissimus dorsi and psoas muscles, the following were determined: pH; buffering capacity; lactic acid; phosphorus; acid-labile phosphate of adenosine-triphosphate; total nitrogen; and "hardness", using a "penetrometer" made from a spring balance. In some cases the onset of rigor mortis was preceded by a temporary arrest of lactic acid formation. The physical change was accompanied by a considerable decrease in retention of fluid and a relatively rapid transition to a state of wetness.

(The above abstract appears in Food Science Abstracts 25, No. 3, 254, May, 1953 and is reprinted here)

8.64 STUDIES ON THE VITAMIN B_{12} OF AQUATIC ANIMALS.II. THE VITAMIN B_{12} CONTENT OF FISH (2)

Yanase, Masaaki
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 11, 629-635 (1953)

The vitamin B_{12} content of fish flesh and fish liver was measured by microbiological assay using Euglena as the test organism. The fish materials were digested by pancreatin prior to hot water extraction. The measured values for 54 species of marine and fresh-water fish are given. Some of these are presented in the table below.

Vitamin B_{12} Content of Some Marine and Fresh-Water Fishes
(vitamin B_{12} content in γ per 100 g. fresh matter)

Species	Sample no.	Body length cm.	Body weight g.	B_{12} content Flesh	B_{12} content Liver
Yellowfin tuna, Neothunnus macropterus				0.37	
Albacore, Germo germo				0.17	
Herring, Clupea palasii	1	32	345	1.9	7.8
	2	24.5	155	1.0	5.1
	3	28.5	340	2.4	5.3
	4	25	200	0.47	5.2
Sardine, Sardina melanosticta	1	19.5		0.74	4.4
	2	14.3	40.5	1.5	6.3[1/]
Anchovy, Engraulis japonicus		12.5	18	0.33	4.0[1/]
Dog salmon, Oncorhynchus keta		52	2060	0.14	2.3
Red salmon, Salmo nerka		53	2250	0.12	2.8
Cod, Gadus macrocephalus		56	4200	0.09	0.9

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Reprinted in part

2.116 NEW FISHERY-TYPE SONAR PROVES SUCCESSFUL

Anonymous
U. S. Department of the Interior, Fish & Wildlife Service, Seattle, Washington, Fishery Products Report No. 138 (July 15, 1953)

The new type ASDIC, especially developed for locating fish schools, is being placed in production in Norway according to the June 10 Fiskets Gang, a Norwegian trade paper. The device has been constructed by the ASDIC Division of the Defense Research Institute in Horton. It is built on the basis of the Institute's experience with the ASDIC it installed earlier on the Norwegian fishery research vessel G. O. Sars. A model of the device was tested on the herring fishing grounds during the past season and gave such promising results that volume production is getting under way. The production rights have been turned over to Simonsen Radio A/S, Olso. This firm has had experience with similar production in the manufacture of depth finders.

The device, which can also be used as a depth finder, takes little space. It is easy to service and can be mounted in a vessel as short as 80 ft. in length. During the winter herring fishery it located herring schools at distances of 1 to 1 1/4 miles. It is anticipated that the equipment can be produced so cheaply with volume production that the price will not hinder widespread use in the fishing fleets. The excellent results which have been obtained have aroused international attention. Orders and requests for information already are on hand from a number of countries. The device is the result of intimate cooperation between the Defense Research Institute, the Directorate of Fisheries Ocean Research Institute, and Norwegian industry.

Reprinted in whole

8.56

Vitamin B_{12} Content of Some Marine and Fresh-Water Fishes
(Continued)

Species	Sample No.	Body length cm.	Body weight g.	B_{12} content Flesh	B_{12} content Liver
Dogfish, Squalus sucklii	1	90	6000	0.06	0.11
	2	60	1000	0.02	0.52
Hammerhead shark, Cestracion zygaena		117			0.62
Beef				0.34	6.0
Moray eel, Gymnothrax kidako		59.8	406	0.44	0.46
Dolphin, Coryphaena hippurus	1	85	6290	0.04	2.2
	2	22	134	0.08	2.2
Barracuda, Sphyraena japonica	1	15	26	0.21	6.9
	2			0.08	19
Surf perch, Ditrema temmincki	1	19.2	160	0.05	7.0
	2	14.5	70	0.09	18
	3	15	80.4	0.07	20
Croaker, Nibea schlegeli	1	19	141	0.10	5.6
	2	15	60	0.15	6.4
Rock cod, Sebastiscus marmoratus		20	235	0.04	21
Common flounder, Paralichthys olivaceus	1	42	1335	0.03	1.8
	2	30	577	0.06	3.7
Flat fish, Eopsetta grigoriewi		25	270	0.11	13
Rainbow trout, Salmo irideus	1	23.5	259	0.11	2.0
	2	23	257	0.06	2.5
Brook trout, Salvelinus fontinalis	1	17	229	0.07	1.4
	2	11	111	0.08	4.6
Lamprey, Lampetra japonica		54	225	1.2	10

1/ viscera

8.64 (Cross Reference: 1.2)

2.02 (Cross Reference: 1.95)

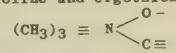
0.38 SPECIFICITY OF TRIAMINEOXIDASE

Tarr, H. L. A.
Journal of the Fisheries Research Board of Canada V, No. 2, 187 (November, 1940)

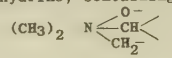
Certain bacterial cells possess an enzyme which activates trimethylamine oxide and allows it to be reduced by dehydrogenase systems of lower potential level. The present work is concerned with the effectiveness of this enzyme in activating various organic bases.

Washed cells of six bacterial species containing the enzyme were suspended and added to tubes containing graded concentrations of the organic bases and also suitable nutrients. After 18 hours the contents of each tube were transferred to Conway dishes, formaldehyde and potassium carbonate were added and the amount of volatile base was determined.

It was found that all six bacterial cultures exhibited a similar specificity toward each of the organic bases studied. Trimethylamine oxide and triethylamine oxide were most strongly activated. Tripropylamine oxide was also activated but to a much lesser degree than the methyl and ethyl analogues. There was no significant activation of betaine, choline, acetylcholine and ergothioneine, all of which possess a



structural grouping. Stachydrine, containing a



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0.39 THE FATE OF TRIMETHYLAMINE OXIDE AND TRIMETHYLAMINE IN MAN

Tarr, H. L. A.
Journal of the Fisheries Research Board of Canada V, No. 3, 211 (July, 1941)

Lintzel in 1934 reported that normal human urine contained trimethylamine oxide, the daily output being about 66 mg. However, the amount of trimethylamine excreted was found to be negligible, and not above 4 mg. per day. Further information on this subject is described in the present work.

The trimethylamine content of the urine samples was determined by collecting the volatile base in measured acid solution. Trimethylamine oxide was determined by first reducing the oxide with Devarda's alloy and HCl and then collecting the volatile base as before. It was also determined by reduction with trimethylamine oxidase.

The trimethylamine oxide content of four samples of urine from three individuals on a normal mixed diet was found to vary between 110 mg. and 250 mg., calculated as the di-hydrate, for the total daily output of urine. No trimethylamine was detected in the normal urines.

The fate of trimethylamine in the body was studied by feeding the hydrochloride salt at two different rates. In one case it was fed over a 10-hour period and in the other, 5 hours was used to consume the salt. A total sample of 1 gram was fed in each case. The urine was collected over a 24-hour period starting with the first ingestion in each case. For the 10-hour ingestion period 1448 mg. of trimethylamine oxide was found by biological reduction and 1302 mg. was found by chemical reduction. No trimethylamine was found. For the 5-hour ingestion period 1186 mg. of the oxide was found

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2.01 ACTION OF NITRATES AND NITRITES ON BACTERIA

Tarr, H. L. A.
Journal of the Fisheries Research Board of Canada VI, No. 3, 233 (May, 1944)

Previous work has shown that nitrites can be produced from nitrates by bacterial reduction, but the value of nitrites produced in this way for preserving foods is not known. The purpose of this work was to determine the optimum conditions for production of nitrites from nitrates by fish spoilage bacteria and the effect of nitrates and mixtures of nitrates and nitrites on the growth of such organisms in laboratory media at different pH values and in fish muscle itself.

The bacteria used in the experiments were Micrococcus sp. and Achromobacter sp., both of which had been found in previous experiments to be strongly inhibited by 0.02% $NaNO_2$. It was found that the amount of $NaNO_2$ formed by bacterial reduction of $NaNO_3$ in broth medium depended on the pH of the medium. When the pH was kept near 6 either by the acid formed from added glucose or by the addition of sterile HCl, nitrite formation was strongly suppressed, and the medium soon contained no viable bacteria. On the other hand, when the pH was permitted to rise unchecked the medium became quite alkaline, and, with the two cultures studied, 1,800 to 6,950 p.p.m. of $NaNO_2$ was formed from 10,000 p.p.m. of $NaNO_3$ under different conditions, the cultures remaining viable for over 3 months. Toluene immediately stopped bacterial increase, and shortly after its addition no increase in $NaNO_2$ was noticed.

The growth of both nitrate-reducing and non-nitrate-reducing fish spoilage bacteria was retarded by 0.02% $NaNO_2$ in acid medium; but $NaNO_3$ in from 0.1 to 1.0% concentration had either no effect or a relatively trivial and variable effect on their growth either

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4.91 FISH OILS IX. CERTAIN FISH OILS AS SOURCES OF NUTRITIONALLY ESSENTIAL FATTY ACIDS

Bailey, B. E.
Journal of the Fisheries Research Board of Canada VI, No. 2, 109 (August, 1943)

It has been shown that rats fed a diet containing no fat exhibit retarded growth and characteristic skin lesions. Two fatty acids which have been found to be effective in curing this deficiency disease are linoleic acid and arachidonic acid.

In this work the effectiveness of a solid and liquid fraction of salmon egg (ova) oil, pilchard oil and herring oil has been compared with that of methyl linoleate in curing the symptoms of essential fatty acid deficiency in rats.

The rats used in the experiments were weaned when 21 days old and placed on a fat-free diet composed of glucose, casein, brewers' yeast and salts. The diet was supplemented with vitamins A, D, and E. The animals were found to exhibit the symptoms of the disease after 2 1/2 to 4 months on the diet. After the rats had shown declining weight continuously for two weeks, together with marked scaliness of the hind paws, they were fed the test materials. The oils were administered from calibrated pipettes. The animals were kept on the test diet for 100 days unless death intervened.

It was found that none of the fish oils were as effective as methyl linoleate in either promoting weight increase or curing the skin lesions.

The activities of the fish oils in curing the skin lesions followed the same order as their iodine values, the liquid fraction of salmon egg oil giving the best results

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2.01 (Cross Reference: 3.12)

in the presence or absence of $NaNO_2$.

In from 0.1 to 1.0 percent concentration, $NaNO_3$ had either no effect, or a relatively trivial and variable effect on the bacteriostatic action of 0.02 percent $NaNO_2$ in fish muscle. In these experiments it was found that $NaNO_3$ was either not, or only slightly reduced to nitrite in spoiling fish muscle.

4.91

and herring oil the least. However, the solid fraction of salmon egg oil and the pilchard oil promoted better growth than either the liquid fraction of salmon egg oil or the herring oil.

0.38 (Cross Reference: 7.81)

grouping, was also found not to be activated. Thus it appears that the enzyme activates compounds having the general structure $R_3 - N = O$.

The nature of the volatile bases produced from trimethylamine oxide and triethylamine oxide was studied by collecting the bases in hydrogen peroxide and preparing the picrate salts. The isolated salts were found to be identical with those prepared from the pure oxides. Attempts to prepare a picrate salt from the volatile base produced from tripropylamine were unsuccessful.

0.39 (Cross Reference: 7.81)

by the biological method and 6.7 mg. trimethylamine was also determined. This indicates that if the amine is fed rapidly the mechanism by which it is converted to the oxide may be overtaxed.

An experiment in which 1 gram of trimethylamine oxide was fed showed that the oxide was practically all excreted unchanged.

0.32 THE ELECTRODIALYTIC REMOVAL OF INORGANIC MATERIAL FROM ORGANIC MARINE PRODUCTS

Dunbar, J. C. and Mitchell, T. J.
Journal of the Science of Food and Agriculture 4, No. 4, 183-190 (April, 1953)

(Abstract of this article appears under 0.30 page 3 - September, 1953 issue)

0.33 SYNTHESIS OF PEPTIDES AND THEIR ROLE IN THE MAILLARD REACTION

Iacobellis, Michael and Schroeder, Lawrence J.
Federation Proceedings 12, No. 1 (Part I), 418 (March, 1953)

0.36 EFFECT OF ENFORCED EXERCISE ON MYOGLOBIN CONCENTRATION IN MUSCLE

Lawrie, R. A.
Nature 171, No. 4363, 1069 (June 13, 1953)

An increased myoglobin content represents one of the responses of muscle tissue to the influence of enforced activity, provided the latter continues over an extended period.

0.36 MECHANISM OF HYDROLYSIS OF ADENOSINE TRIPHOSPHATE CATALYSED BY LOBSTER MUSCLE

Clarke, Edith and Koshland, D. E.
Nature 171, No. 4362, 1023 (June 6, 1953)

1.2 MEAL AND STICKWATER FROM FRESH AND STORED HERRING

Anonymous
Meld. S.S.F., No. 2, 23-28 (1951)
Food Science Abstracts 25, No. 2, 146 (March, 1953)

(Abstract of this article appears under 8.64 page 15)

1.2 CHEMICAL COMPOSITION OF THE BALTIC COD AND HERRING IN RELATION TO THE DEGREE OF SEXUAL MATURITY

Kordyl, E.
Prace Morsk. Inst. Ryback, No. 6, 145-147 (1951)
Food Science Abstracts 25, No. 2, 154 (March, 1953)

(Abstract of this article appears under 8.50 page 19 - September, 1953 issue)

1.2 FLUCTUATIONS IN THE CONTENT OF WATER AND FAT IN THE COD

Bogucki, M. and Trzesinski, P.
Biul. Morsk. Inst. Ryback, No. 5, 25-30 (1950)
Food Science Abstracts 25, No. 2, 154 (March, 1953)

(Abstract of this article appears under 8.50 page 19 - September, 1953 issue)

1.5 MILKINESS OF HAKE

Anonymous
Report of the Food Investigation Board (Great Britain) for 1952, 31-32 (1953)

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1.5 CHEMICAL COMPOSITION OF THE BALTIC COD AND HERRING IN RELATION TO THE DEGREE OF SEXUAL MATURITY

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1.5 FLUCTUATIONS IN THE CONTENT OF WATER AND FAT IN THE COD

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1.1 THE RELATIONSHIP BETWEEN TUNA OF DIFFERENT REGIONS

Hardy, Eric
Atlantic Fisherman 34, No. 5, 21 (June, 1953)

1.30 GLAZING BRINE-FROZEN SALMON -- T. N. #26

Miyauchi, D. T.
Commercial Fisheries Review 15, No. 5, 24-25 (May, 1953)

(Abstract of this article appears under 3.24 page 15 - September, 1953 issue)

1.79 THE BASKING SHARK: A DISCUSSION OF COMMERCIAL POSSIBILITIES (I)

Maxwell, Gavin
World Fishing 2, No. 5, 189 (May, 1953)

1.79 ANALYSIS OF BRITISH COLUMBIA RATFISH

Anonymous
Fisheries Research Board of Canada, Progress Reports of the Pacific Coast Stations, No. 94, 23 (March, 1953)

(Abstract of this article appears under 8.51 page 5 - July, 1953 issue)

1.81 A PRACTICAL MECHANICAL OYSTER DREDGER

Anonymous
Fishing Gazette 70, No. 6, 50D (June, 1953)

(Abstract of this article appears under 2.1128 page 1)

1.81 HIGH LABOR COSTS, WASTE ELIMINATED BY MECHANIZED BREADING OF OYSTERS

Anonymous
Food Processing 14, No. 7, 18-19 (July, 1953)

(Abstract of this article appears under 3.231 page 11 - September, 1953 issue)

1.84 STATUS OF NEW ENGLAND SEA-SCALLOP FISHERY

Prenetz, Ernest D. and Snow, George W.
Commercial Fisheries Review 15, No. 5, 1 (May, 1953)

1.9 CHARACTERISTICS OF SQUID MEAT

Migita, Masao
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 10, 559 (1953)
(English summary)

1.85 QUICK FREEZES AND CARTONS SHRIMP AT SEA

Wright, C. E.
Food Engineering 25, No. 5, 133 (May, 1953)

(Abstract of this article appears under 3.230 page 5 - August, 1953 issue)

1.85 CAUSES OF LOSS IN WEIGHT OF FROZEN PACKAGED SHRIMP

Fieger, E. A.; Frilox, James J.; and Norton, E. J.
Fishing Gazette 70, No. 4, 44 (April, 1953)

(Abstract of this article appears under 3.239 page 3 - August, 1953 issue)

1.86 THE UNPREDICTABLE BLUE CRAB FISHERY

McHugh, J. L. and Ladd, E. C.
National Fisheries Yearbook, 127 (1953)

1.89 EXAMINATION OF SALPS

Brachi, R M.
Biochemical Journal 54, No. 3, 466 (June, 1953)

(Abstract of this article appears under 8.6170 page 13 - September, 1953 issue)

1.95 OBSERVATIONS ON RIGOR MORTIS IN WHALE MUSCLE

Marsh, B. B.
Biochim. Biophys. Acta 9, 127-133
Food Science Abstracts 25, No. 3, 254 (May, 1953)

(Abstract of this article appears under 2.02 page 15)

1.95 B. C. WHALE MEAT FROZEN FOR PETS

Anonymous
Pacific Fisherman 51, No. 9, 71 (August, 1953)

(Abstract of this article appears under 6.53 page 1)

1.95 EXAMINATION OF SOME COMPONENTS OF CEPHALOPOD AND SPERM-WHALE LIVER OILS BY THE CHROMATOGRAPHIC METHOD

Brachi, R. M.
Biochemical Journal 54, No. 3, 459-465 (June, 1953)

(Abstract of this article appears under 8.6179 page 13 - September, 1953 issue)

2.1121 MODEL EXPERIMENTS ON TRAWL NETS OF VARIOUS TYPES

Nomura, Masatsune and Yasui, Tatsuo
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 12, 727 (1953)
(English summary, figures, and tables)

Relationship between the resistance and towing speed of trawl-nets and deformation of the nets under towing was observed in tank experiments using an ordinary otter trawl, a Danish seine, a two-boat-type trawl, a Japanese-type small-sized trawl, and a Japanese-type small otter trawl.

2.1121 RESISTANCE OF PLANE NET AGAINST THE FLOW OF WATER--II. EFFECT OF DIFFERENT SHAPES OF THE MESH UPON THE RESISTANCE OF NET AGAINST THE FLOW

Miyamoto, Hideaki and Nomura, Masatsune
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 7, 327 (1953)
(English summary, tables and figures)

2.1121 ON THE EXPERIMENTAL STUDY HOW THE FISHES PASS THROUGH THE MESH OF VARIOUS SHORTENING NETS -- I.

Kanda, Kenji
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 8, 365 (1953)
(English summary, tables, and figures)

2.1127 NORWEGIAN AUTOMATIC BAITING MACHINE PROVES SUCCESSFUL

Anonymous
U. S. Department of the Interior, Fish and Wildlife Service, Seattle, Washington
Fishery Products Reports No. 138 (July 15, 1953)

An automatic baiting machine for line fishermen was tested this past winter by a Norwegian fishing vessel with good success, according to the June 10 Fiskets Gang, a Norwegian trade paper. The device was invented by Nils Sonderland of Roald in Sunmore. Ola H. Faerovik, who tested the device in his fishing vessel, reported that it worked very well with fresh bait, even in rough weather. With good bait it was about 90 percent effective. There was no waste of bait and no apparent difference in the catch of hand-baited and automatically-baited hooks. It saved much time and labor, and with a few improvements should be well accepted, especially in the cusk and ling fisheries.

2.1127 BLOCK FREEZING OF BAIT IN ALGINATE GELATIN

Anonymous
Commercial Fisheries Review 15, No. 4, 54 (April, 1953)

A promising method for block freezing of bait in an alginate gelatin has been tested by a Drammen, Norway firm. The method appears suitable for preserving bait over long periods of time. It is reported to hinder the bait from breaking up and to protect it from rancidity. Tests at the Industry Laboratory in Kristiansund and during practical trials in the Greenland fishery showed promising results. Additional tests will be made this winter at various freezers under the direction of the inventor, Alf Olsen.

2.14 STUDIES ON THE PRACTICALITY OF NEW FISHERIES BY LOW FREQUENCY ELECTRIC-SHOCKS--III. ABOUT THE ELECTROCUTING TEST ON THE SHARKS IN THE LONG-LINE FISHING

Kuroki, Toshiro; Morita, Tomokazu; and Fukudome, Tatsuro
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 8, 359 (1953)
(English summary and tables)

By using the harpoon electrode all of the tested fishes were killed on the spot within 40 secs. with an output of 190-230 volts d.c., 15-40 rhythms per second, and a 0.0003-0.0015 sec. pulse duration.

2.14 STUDIES ON THE ELECTRIC FISH SCREEN--VIII. ABOUT THE INTERRUPTION OF THE ELECTRIFYING IN TRAWL-NET FISHING

Kuroki, Toshiro
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 9, 385 (1953)
(English summary, figure and table)

It is suitable to supply electricity for about 30 secs., and to interrupt it for 1-2 mins.

2.14 STUDY ON THE SHUNNING LIGHT FOR FISHERIES. I. ABOUT THE BRANDISHED LIGHT BEAM

Kuroki, Toshiro and Chuman, Michio
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 10, 468 (1953)
(English summary, table and figures)

A flashing light, flashed at intervals of 2 to 3 per second irregularly, had slight effect on some kinds of fishes.

2.14 STUDIES ON THE ELECTRIC FISH SCREEN--VII. ABOUT THE PRACTICAL ARRANGEMENTS OF ELECTRODES TO GIVE PROPER DISTRIBUTION OF POTENTIAL

Kuroki, Toshiro and Chuman, Michio
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 9, 381 (1953)
(English summary and figures)

The authors describe the potential distributions that are caused by some arrangements of model electrodes in sea water under practical conditions.

2.14 EXPERIMENTAL TUNA PURSE SEINING IN THE CENTRAL PACIFIC

Murphy, Garth I. and Niska, Edwin L.
Commercial Fisheries Review 15, No. 4, 1 (April, 1953)

Tuna purse seining shows little promise of success in Central Pacific waters.

2.14 TUNA ATTRACTION AND LONG-LINING--IDEAS ON HOW TO MAKE THEM WORK

Hill, James F.
Pacific Fisherman 51, No. 6, 44 (May, 1953)

2.14 STUDY ON THE ELECTRIC FISHING-NET. IX. ABOUT THE RELATIONS BETWEEN ELECTRIC-POWER AND ELECTROCUTION

Kuroki, Toshiro
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 12, 698 (1953)
(English summary, tables and figures)

3.10 EXPERIMENT ON THE PRESERVATION OF FISH CAKE BY CHEMICALS AND ULTRAVIOLET RAY

Tetsumoto, Sogo; Uchiyama, Hitoshi; Yokoyama, Wakichi; and Okitsu, Tomoaki
Bulletin of the Japanese Society of Scientific Fisheries 19, No. 1, 34 (1953)
(English summary, tables and figures)

Furaskin (5 nitro 2 furfuryl semicarbazone) (0.003%) is the most effective among the three preservatives, while panazone (Bis 5 nitro furfurylidine acetoneguanyl hydrazone) (0.003%) has least preservative power for fish cakes. The ultraviolet ray proved to have an antiseptic effect and preservative effect slightly stronger than those of D.H.A. (Dehydro acetic acid) (0.01%).

3.12 ACTION OF NITRATES AND NITRITES ON BACTERIA

Tarr, H. L. A.
Journal of the Fisheries Research Board of Canada VI, No. 3, 233 (May, 1944)

(Abstract of this article appears under 2.01 page 17)

3.12 ANTIBIOTICS IN FOOD BANNED

Anonymous
Chemical and Engineering News 31, No. 10, 976 (March 9, 1953)

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Australian Journal of Marine and Freshwater Research
Biochemical Journal
Bulletin of the Faculty of Fisheries, Hokkaido University
Bulletin of the Japanese Society of Scientific Fisheries
California Fish and Game
Canadian Fisherman
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Fisherman
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Flour and Feed
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Food Manufacture
Food Packer
Food Preservation Quarterly
Food Processing
Food Research
Food Technology
Foreign Commerce Weekly
Frosted Food Field
Gourmet
Ice and Refrigeration
Industrial and Engineering Chemistry
Journal of Agricultural and Food Chemistry
Journal of Applied Chemistry
Journal of Biological Chemistry
Journal of Home Economics
Journal of Nutrition
Journal of the American Chemical Society
Journal of the American Dietetic Association
Journal of the American Oil Chemists' Society
Journal of the Association of Official Agricultural Chemists
Journal of the Fisheries Research Board of Canada
Journal of the Science of Food and Agriculture
Maine Coast Fisherman
Modern Packaging
Modern Refrigeration
National Provisioner
Nature
Nutrition Reviews
Pacific Fisherman
Pan American Fisherman
Poultry Science
Practical Home Economics
Progressive Fish-Culturist
Quick Frozen Foods
Refrigerating Engineering
Report of the Food Investigation Board (Great Britain)
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Southern Fisherman
Trade News (Fisheries Department, Canada)
Western Canner and Packer
Western Fisheries
World Fishing

Articles chosen for abstracting or inclusion as bibliographical references are those deemed of interest to the commercial fisheries and to fishery technological laboratories. Occasionally pertinent articles from sources other than the above listed publications are included. Biological papers are generally omitted.

3.230 INVENTOR CITES FEATURES OF NEW FILLET MACHINE

Anonymous
Quick Frozen Foods 15, No. 12, 71 (July, 1953)

(Abstract of this article appears under 2.3 page 19 - September, 1953 issue)

3.231 RUSTING PREVENTED BY USE OF "INHIBITED SALTS"

Anonymous
Chemical Processing 16, No. 6, 174-175 (June, 1953)

(Abstract of this article appears under 2.113 page 15 - September, 1953 issue)

3.231 MOISTURE IN REFRIGERATING MACHINERY CIRCUITS AND COMPONENTS--I. ITS EFFECTS, PREVENTION OF ENTRY AND DEHYDRATION

Ranken, M. B.
Modern Refrigeration 56, No. 663, 203 (June, 1953)

3.249 CAUSES OF LOSS IN WEIGHT OF FROZEN PACKAGED SHRIMP

Fieger, E. A.; Frilox, James J.; and Norton, E. J.
Fishing Gazette 70, No. 4, 44 (April, 1953)

(Abstract of this article appears under 3.239 page 3 - August, 1953 issue)

4.69 SYNTHESES OF ANTIOXIDANTS FOR FATS AND OILS. II. CRESOL ANALOGS OF N.D.G.A. AND POLYNUCLEAR PHENOLIC ANTIOXIDANTS

Shishido, Keiichi and Kuyama, Hiroshi
Bull. Inst. Chem. Research, Kyoto Univ. 26, 87-8 (1951) (In English)
Chemical Abstracts 47, No. 8, 3817 (1953)

4.89 HYDROXYLATION: NEW UNIT PROCESS

Anonymous
Chemical Engineering 60, No. 8, 118-122 (August, 1953)

(Abstract of this article appears under 6.138 page 11)

4.89 STUDIES ON THE ANTIBIOTIC ACTION OF FISH COMPONENTS. II. PRODUCTION OF THE ANTIBIOTIC ACTION OF FATS, OILS AND METHYL ESTERS OF FATTY ACIDS BY THE ADDITION OF CUPRIC SULFATE

Tomiyasu, Yukio and Toyomizu, Masamichi
Bulletin of the Japanese Society of Scientific Fisheries 18, No. 6, 263 (1952)
(English summary and tables)

4.89 NEW FATS THAT STAY PLASTIC

Feuge, R. O.
Food Engineering 25, No. 6, 100 (June, 1953)

6.3 THE ELECTRODIALYTIC REMOVAL OF INORGANIC MATERIAL FROM ORGANIC MARINE PRODUCTS

Dunbar, J. C. and Mitchell, T. J.
Journal of the Science of Food and Agriculture 4, No. 4, 183-190 (April, 1953)

(Abstract of this article appears under 0.30 page 3 - September, 1953 issue)

6.3 SOME TYPICAL ANALYSES OF RED SEAWEEDS

Ross, Alan G.
Journal of the Science of Food and Agriculture 4, No. 7, 333-335 (July, 1953)

(Abstract of this article appears under 7.50 page 11)

6.3 THE GRASS OF THE OCEANS

Weiss, Francis J.
National Fisheries Yearbook, 33 (1953)

The author discusses the potentialities of marine algae.

6.3 MASS PRODUCTION POSSIBILITIES SEEN FOR ALGACULTURE

Anonymous
Journal of Agricultural and Food Chemistry 1, No. 9, 596 (July 22, 1953)

6.73 AMBERGRIS

Raoul, Waldemar; Iachan, Abrahao; and Gottlieb, Otto Richard
Rev. quim. ind. (Rio de Janeiro) 21, No. 238, 18-23 (1952)
Chemical Abstracts 47, No. 2, 828 (1953)

6.73 CONSTITUENTS OF AMBERGRIS. VII. OXIDATION AND DEGRADATION PRODUCTS OF AMBREIN: COMPOUNDS WITH AMBERGRIS SMELL

Coll-Asselineau, Cecile; Lederer, E.; Mercier, D.; and Polonsky, J.
Bull. soc. chim. France 1950, 720-8
Chemical Abstracts 47, No. 9, 4307 (1953)

6.73 CONSTITUENTS OF AMBERGRIS. XIV. TOTAL SYNTHESIS OF RACEMIC AMBREINOLIDE AND SOME OF ITS DERIVATIVES

Dietrich, P. and Lederer, E.
Helv. Chim. Acta 35, 1148-55 (1952) (In French)
Chemical Abstracts 47, No. 9, 4311 (1953)

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